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Soil and Water Conservation News

United States Department of Agriculture
Soil Conservation Service



Soil and Water Conservation News is the official magazine of the Soil Conservation Service. The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of public business required by law of this Department. Use of funds for printing *Soil and Water Conservation News* has been approved by the Director of the Office of Management and Budget through January 31, 1985. *Soil and Water Conservation News* (ISSN-0199-9060) is published 12 times a year. Postage paid at Washington, D.C.

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U.S. Government Printing Office
Washington, D.C. 20402

Comments:

From the SCS Chief

Conservation tillage systems presently offer one of our best hopes for improved resource management on cropland. Leaving adequate amounts of crop residue on the soil surface year round reduces sheet and rill erosion, the worst offenders on cropland, by as much as 90 percent. Reducing erosion protects the long-term productivity of the soil.

Conservation tillage alone, however, is not the total solution to erosion problems and reduced fertility of cropland. Under many conditions, conservation tillage must be applied as part of a complete conservation system in combination with terraces, grassed waterways, diversions, and other practices. As part of an overall conservation system, conservation tillage appears to be the most cost-effective method of controlling erosion on the Nation's cropland.

It is the consensus of most experts that some form of conservation tillage can be applied to every acre of cropland in the United States. There is a definite trend away from using the moldboard plow, and U.S. farmers have shown that they recognize the benefits of reduced tillage systems. Conservation tillage rose from 26.7 million acres in 1972 to an estimated 96.8 million acres in 1981. We provided technical assistance to farmers on many of these acres.

In our efforts to promote reduced tillage systems, however, we need to realize that in today's economy farmers are seldom guilty of plowing for no reason. Many farmers have justifiable concerns about using no-till and other similar tillage systems. More research is needed in applying no-till under a wider variety of soil and climatic conditions, and SCS must promote and assist with that research.

We have created a new position in the National Office, a national conservation tillage specialist who will coordinate tillage-related activities with other USDA agencies and interested groups. Our goal is to share the same concepts of conservation tillage, to achieve our research objectives, and, ideally, to apply conservation tillage nationwide.

In your conservation planning with farmers and ranchers, I urge you to continue your success in promoting the steady growth of conservation tillage systems in 1982. It is not a coincidence that in areas where conservation tillage is rapidly expanding, our field personnel are enthusiastic about it and actively promote it. We must continue to develop and apply resource management systems that reduce erosion, protect water quality, and support food and fiber production.



Cover: A Montgomery County, Md., farmer plants corn in small grain stubble using the no-till method. The broadleaf weeds that are visible will be killed with a contact herbicide after the corn is planted and before it emerges. (Photo, Tim McCabe, photographer, Information and Public Affairs, SCS, Washington, D.C.)

Conservation Tillage: A Practice Whose Time Has Come

by Donald L. Comis

Soil erosion from wind and water is so excessive on one-quarter of the Nation's cropland that it threatens the long-term productivity of this land. In addition, much of the Nation's cropland is slowly losing organic matter. In the 1970's, the Nation's farmers began shifting to a conservation practice that helps to solve these problems. The practice is conservation tillage, and in combination with other

conservation measures it promises to be the most widely used farm conservation practice ever developed.

According to Arnold King, the Soil Conservation Service's national staff agronomist, conservation tillage is the use of cultural techniques that maintain enough crop residue on the soil surface, year round, to protect the soil from erosion. No-till is the purest form of conservation tillage because it disturbs the soil the least and leaves almost all the residue on the soil surface.

With no-till, farmers do not till the soil from the time they harvest one crop to the time they plant the next. At planting time, no-till farmers disturb only a very narrow strip of soil, about 2 inches wide, with coulters that cut through the

residue to provide a slot for seed planting.

Other forms of conservation tillage include techniques that bury some of the crop residue by tilling prior to planting or that sweep the residue aside to clear a narrow strip of soil in which to plant the seed. Many people refer to these other forms of conservation tillage as reduced or minimum tillage because they involve some tillage, usually with a chisel plow or disk, prior to planting; but they still use less tillage than conventional farming.

Arnold King says, "In choosing a conservation system a farmer must consider the weed problem, the crop to be planted, available equipment, soil and climatic conditions, erosion hazards, and other situations." For example, in the northern United States, wet, poorly drained soils are cold soils and may need some tillage to dry out the topsoil and warm it to the proper temperature for seed germination. The more erosive soils and soils with steep slopes may require different techniques than less erodible and more level soils.

Conservation tillage was originally designed to reduce erosion and increase production by conserving moisture in semiarid areas of the Nation. These are still important benefits of conservation tillage, but environmental concerns and the sharp rise in the price of diesel fuel have caused farmers to consider conservation tillage in all parts of the Nation. Conservation tillage saves farmers 1 to 5 gallons of diesel fuel per acre, and it also saves them time.

While the net energy savings of conservation tillage are not significant on a national basis, the



savings in diesel fuel is significant to individual farmers. The time saved by less tillage is also important to farmers because it can give them the opportunity to increase their profits by diversifying their farm operation.

Conservation tillage makes doublecropping more practical, especially with soybeans and wheat. Farmers can plant soybeans right behind a combine that is harvesting wheat, both in the same day.

Conservation tillage also improves soil tilth and structure by increasing organic matter and soil organisms.

Conservation tillage is giving farmers the same or better yields, in most cases, than conventional tillage. The yield advantage depends mainly on proper management.

Many people say that conservation tillage requires better management skills than conventional tillage because there are fewer chances to correct errors such as improper herbicide treatments. But others say that all farmers have to be good managers to be successful.

The major disadvantage of conservation tillage, especially no-till, is its reliance on chemicals to control weeds. A theoretical disadvantage is its potential to increase disease and insect problems because of the residue left on the surface. King stresses that he has not heard of many cases where that has actually happened.

King responds to fears about more pesticide pollution with conservation tillage by saying that, in practice, conservation tillage uses the same amount of pesticides as conventional tillage, except for a contact herbicide used in conserva-

tion tillage that does not present any known environmental hazard. "Conservation tillage generally results in less runoff and erosion so it can reduce pollution by keeping chemicals in place where they are applied," King says.

The discovery of plant growth regulators in the 1940's led to the development of herbicides and made conservation tillage technically feasible for the first time. In the 1960's, the U.S. Environmental Protection Agency registered the first major contact herbicide. Now farmers can use a contact herbicide, instead of plowing, to kill all live vegetation on a field before the new crops emerge.

Farm equipment companies began developing conservation tillage equipment, mainly corn planters for the Midwest; and, in the 1970's, the number of farmers using conservation tillage increased dramatically.

Manufacturers are improving conservation tillage planters for wheat in the Great Plains. Great Plains farmers are also waiting for selective residual herbicides that will kill weeds without killing wheat. Farmers in the Southeast are waiting for more effective chemicals for grassy annual and perennial weeds.

King says that more time and a combination of research and field experience are needed to spread some form of conservation tillage to every acre of arable land in the Nation.

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*,
SCS, Washington, D.C.

Agencies Test Conservation Tillage Systems for Vegetables

by Frederick B. Gaffney

For years, a common problem for vegetable growers of commercial processing crops has been the need for fine seedbed preparation and clean cultivation, which leaves the soil unprotected and highly susceptible to erosion. Now, conservation tillage methods are being tested to help solve this erosion problem.

The main objective of the 3-year trials in New York is to evaluate how different tillage methods control erosion and affect the quality and growth of vegetables. Cooperating in the testing are the Soil Conservation Service plant materials center (PMC) in Big Flats, the Vegetable Department of Cornell University in Freeville, the Geneva Agricultural Experiment Station, and Agway, Inc.

One of the tillage methods being evaluated involves the use of a living mulch—grasses or legumes—between rows of vegetables. The living mulch concept is not new but is more practicable now because several herbicides are available for regulating most cover crops. A common problem following seeding of conventionally tilled vegetable crops is soil crusting which inhibits emergence. Use of a living mulch between the rows helps prevent crusting, controls erosion, adds organic matter to the soil, and maintains soil tilth. The technique may also cut farmers' costs by eliminating the need for costly terraces to control erosion and protect the long-term productivity of the soil.

The four cooperating agencies are each conducting trial plantings of sweet corn and direct-seeded cabbage on sites of 1 to 2 acres. Each cooperator furnished equipment, seed, or chemicals to implement the trials. The first trial plantings were established in May 1981. Tillage treatments include no-till, strip-till, living mulch combined with strip-till, and conventional tillage. No-till was not used with the cabbage.

To establish the living mulch plots, white clover was seeded between rows of cabbage and corn in early July 1981. In spring 1982, only a narrow strip will be tilled for seeding vegetable crops into the clover.

On the strip-tilled plots, a cover crop of 'Aroostook' rye was first killed with a herbicide. A chisel-point was then used to fracture the rooting zone of the soil, and narrow strips were tilled for seeding the vegetable crops. On the no-till plots, the cover crop was also killed with a herbicide, and corn was planted into each plot with a no-till planter.

At the Big Flats PMC, plant materials specialists recorded corn data which include emergence, stand, silking and maturity dates, yield along with quality checks of husked ear weight (kernels removed from the cob), and percentage of moisture. Cabbage data include emergence, stand, and harvest weight.

Plant materials specialists observed uniform emergence under all tillage treatments except the no-till corn. This is probably a mechanical problem as two different corn planters were used. The conventional planter was not heavy enough to work in cover crop

residue. Specialists say that the difference in corn planters, field conditions, and soil temperatures may account for the differences between plant emergence on the no-till plots and other plots. The plant development of no-till sweet corn appeared to be about the same, however, as for conventionally tilled corn, and little or no difference occurred in husked weights, cut weights, or percent moisture. The three tillage treatments with cabbage demonstrated no significant difference in emergence and yields.

Through the trial plantings, SCS plant materials specialists are also evaluating the management problems and refining the management techniques associated with grow-

ing vegetable crops under conservation tillage systems. Experience with the trial plantings will enable SCS to better assist commercial growers who adopt the systems.

A summary of data from all four locations is scheduled to be presented early in 1982. With the continued cooperation of Federal and State agencies and commercial companies, conservation tillage systems can be developed and applied to vegetable production throughout the United States. Both erosion control and food production must be integral parts of cropping systems for the future.

Frederick B. Gaffney,
plant materials specialist, SCS, Syracuse, N.Y.



In the first year of the living mulch trials, clover was interseeded between rows of cabbage. This spring, the cabbage will be seeded into established clover. The manager of the Big Flats PMC employed 23 inmates of the Elmira Correctional Institute to harvest the vegetables from the conservation tillage trials. The inmates received the vegetables, including 8 tons of cabbage, in exchange for their work.

Ohio County Promotes Conservation Tillage

by Robert K. Kissler
and Donald L. Comis

The Knox County Soil and Water Conservation District (SWCD) in Ohio has used aggressive promotion to convert 75 percent of the county's cropland from conventional tillage to conservation tillage in only 7 years.

Knox County is a rural county in central Ohio. It is rolling country, with an average slope of 6 percent, and mostly poorly drained, silt loam soils. Soil Conservation Service District Conservationist Ray Adamski says that conservation tillage is reducing Knox County's annual soil loss from an average 8 tons per acre to less than 2 tons per acre.

Adamski came to Knox County in 1973 when only two or three farmers owned no-till planters. This year more than 200 farmers own no-till planters.

With the conservation district's support and encouragement, Adamski and Bill Haddad, a representative of a national chemical company, began visiting no-till fields during the spring planting in 1974. When a no-till crop failed, Adamski and Haddad kept returning to the field until they learned why. They discovered that in almost every case the crop failed because the farmer either did not follow proper instructions or received the wrong information from a neighbor.

"A herbicide recommendation is like a doctor's prescription," Adamski explained. "A doctor gives you a prescription based on a diagnosis of *your* body, not your

neighbor's, and the same is true for your fields. You have to know the weeds in *your* fields to apply the correct herbicide combinations at the prescribed rate." Adamski also emphasized that farmers should heed safety precautions on herbicide container labels.

During their field visits, Adamski and Haddad advised farmers to drive slowly while planting, use the right coulter at the right depth for seed placement, and use the right amount of seed for each crop. They advised farmers to adjust the tension on spring-loaded seed press wheels daily, to pack the soil and seed together under changing moisture conditions. They also advised farmers to adjust their disks for fertilizer placement to avoid placing fertilizers on seeds, which interferes with seed sprouting.

To help promote conservation tillage, Adamski worked with the conservation district to develop a brochure that warns that such planter adjustments are critical for success in conservation tillage. The brochure tells farmers how to succeed without tillage and includes interviews with four successful no-till farmers.

In another effort to promote no-till, the Knox County SWCD sponsors a no-till contest every year, giving away \$1,200 worth of prizes to farmers with the highest no-till yields. Adamski says the contest encourages farmers to try no-till on their best land rather than on their worst as many had done before the contest started.

The contest is so successful that the chemical company Haddad works for teamed up with Ohio's Department of Natural Resources, Division of Soil and Water Conservation Districts, to sponsor a state-

wide no-till contest each year. In 1978, Knox County farmer John Piar won a trip for two to Hawaii in the statewide contest, with a no-till yield of 180 bushels of corn on 1 acre. Piar had planted his first 120 acres of no-till corn and soybeans that year. This year, Piar and his brother-in-law used no-till on 1,500 of 2,000 acres planted to corn and 350 of 800 acres planted to soybeans.

Piar learned enough about no-till from seminars sponsored by the SWCD to be ready to start no-till in 1975. But he says he had to wait until 1977 for a suitable no-till planter to be marketed.

Piar says that no-till significantly reduced erosion on his land and gave him more even stands of corn and better yields. The stands are more even because the crop residue holds rainwater and soil in place in areas that used to erode severely and grow shorter corn than the rest of the field.

Piar says that he has no problems with fertilizer incorporation because his no-till corn develops surface root hairs to use the fertilizer at the surface. His major pest problem was with armyworms in a winter rye cover crop residue so he does not use a cover crop, but plants corn directly into the previous season's cornstalks.

Piar says that farmers should not give up on conservation tillage when they have a yield reduction but should find out what they did wrong just as they would do with conventional tillage.

The Knox County SWCD also promotes conservation tillage by organizing field trips to farms that use the practice and works with a no-till club that meets every other week from December until planting

time. The SWCD gives the club members a T-shirt with a no-till logo to give their efforts visibility in Knox County.

The Knox County SWCD is a model county for promoting conservation tillage and providing the technical information needed to manage the program.

Robert K. Kissler,
public information officer, SCS, Columbus, Ohio

Donald L. Comis,
assistant editor, *Soil and Water Conservation News*,
SCS, Washington, D.C.

New York Farmers Follow Ohio's Lead

by John J. Rappa

Inspired by Knox County, Ohio, more than 100 Ontario County, N.Y., farmers planted a total of 6,000 acres of no-till crops this year, the second year of a no-till project that began with 51 farmers planting 2,153 acres in 1980. Farmers who did not sign up for the project planted another 3,000 acres of no-till crops in 1981.

Ontario County, in the Finger Lakes region of western New York, is one of the most productive farming counties in the State.

Charlie Smith, then with USDA's Extension Service, and Joe Doleski of USDA's Agricultural Stabilization and Conservation Service, along with the Soil Conservation Service district conservationist, initiated and coordinated the Ontario County no-till project. The idea for the project came after they toured no-till farms in Knox County in August 1979, with farmers from Ontario County and other areas.

When they returned to Ontario

County, they scheduled a no-till meeting at which they signed up 17 farmers. They spent the fall and winter signing up more farmers after events such as a no-till seminar. They also designed individualized management plans for each farmer.

To write these management plans, the project coordinators visited each field to test the soil and identify weeds and insect pests. Based on these soil tests and field observations, the project coordinators recommended specific applications of fertilizers, lime, herbicides, and insecticides. For the pesticide applications, the coordinators considered the amount and type of crop residue the farmers would be planting in. They also considered the crops that farmers would plant in each field and recommended the amount of seed to plant.

In fall 1979, farmers in the project planted 171 acres of wheat and 22 acres of rye without tillage. On April 1, 1980, to prepare farmers for spring planting, equipment dealers demonstrated their conservation tillage planters to the farmers they would be lending the machines to. On this same day, the no-till project coordinators gave the farmers hats with a no-till logo decoration to publicize the project.

The farmers waited until their soil warmed up to 50° F before they planted the spring crops. Then the project farmers planted 1,669 acres of corn, 132 acres of alfalfa, 90 acres of oats, 38 acres of barley, 20 acres of soybeans, and 11 acres of kidney beans. The project coordinators helped each farmer daily until the farmers finished planting in July.

After planting time, the coordi-

nators checked the fields daily to identify insect and weed problems. They noticed slug problems in a few fields, but overall they did not find any serious pest problems.

On July 24, Ontario County Agricultural Stabilization and Conservation Service Committee Chairman Charles Mattoon and his brother, Bill Mattoon, who is a member of the Ontario County Soil and Water Conservation District, hosted a well-publicized tour of the no-till fields and a celebration barbecue after the tour.

Andy Burt, Ontario County Soil and Water Conservation District chairman, had the highest yield in the project: 223 bushels of corn per acre on one field. Burt sold an average 90 bushels of corn per acre, compared to the county's average of 83 bushels.

This year, Burt expects to average 100 to 125 bushels of corn per acre. He says he had fewer problems with pests this year than he had with conventional tillage in the years before he switched to no-till. He says that no-till eliminated his problem with a velvetleaf weed because it leaves the weed's seeds on the surface of the soil where they germinate uniformly and quickly, while the herbicides are still effective.

Burt did have a severe problem with slugs in one field with a shallow soil last year, where he planted corn in waist-high hay. He believes that hay more than 1 foot high provides too much moist cover for slugs. This year he planted the corn in that field in a winter rye cover crop residue and did not have a slug problem.

Burt says that drainage is critical to successful no-till because there is no tillage to aerate the soil.

RCA Update

Aside from drainage, he says, a farmer with good management skills could use no-till on almost any kind of soil. Farmers in the no-till project have grown crops without tillage on at least 18 different kinds of soil.

Burt says that the ingredients for successful conservation tillage are: a positive attitude, management skills, and a conservation consciousness.

Mattoon averaged 164 bushels of corn per acre on a 15-acre field. This year he planted 100 acres of corn without tillage and expects a slightly higher yield per acre.

Mattoon believes that conservation tillage is economical for farmers and will be the most widely used conservation measure for that reason. He says the rise in energy costs pushed farmers to consider conservation tillage. He and many other Ontario County farmers are leading the way and planning to surpass Knox County's conservation tillage acreages in the next several years.

John J. Rappa,
was district conservationist and is now area
agronomist, SCS, Canandaigua, N.Y.

 United States Department of Agriculture

**USDA
wants your
opinions
on the
future of soil
and water
conservation**

Please respond by January 15, 1982

The second round of public comments on program proposals prepared under the authority of the Soil and Water Resources Conservation Act of 1977 (RCA) began in earnest during the last week in October 1981.

On October 28, both Secretary of Agriculture John R. Block and Assistant Secretary for Natural Resources and Environment John B. Crowell, Jr., testified before Congress on RCA. Secretary Block appeared before the Senate Committee on Agriculture, Nutrition, and Forestry. Assistant Secretary Crowell appeared before the Subcommittee on Conservation, Credit, and Rural Development of the House Committee on Agriculture.

On October 29, Secretary Block conducted a press conference to announce that the revised draft 1981 RCA Program Report and Environmental Impact Statement is available for review and comment. At the conference, the Secretary emphasized that all program proposals contained in the report are subject to change. Final program

recommendations will be made only after public comments have been received and all points of view have been considered. The public comment period will end on January 15, 1982.

To provide a convenient method for the public to respond in a meaningful way, the Department prepared a response form. The form, accompanied by a brief summary of the program proposals, focuses on specific components of the Secretary's preferred program. Respondents are asked to rate each component on a scale ranging from "strongly approve" to "strongly disapprove."

Copies of the program report were sent to national organizations that have an interest in resource conservation, to Federal agencies that have responsibilities for resource-related programs, to the Governor of each State, to members of Congress, and to those who requested it. Copies of the response form were sent to each person who commented during the last public comment period. The response form can be obtained at local offices of USDA's Soil Conservation Service and the Agricultural Stabilization and Conservation Service.

The Department has established an RCA Response Office in Washington, D.C. The office is staffed to answer questions people have written or telephoned in, to distribute RCA documents on request, and to forward RCA responses to the appropriate State office of the Soil Conservation Service.

James N. Benson,
writer-editor, Planning and Evaluation,
SCS, Washington, D.C.

News Briefs

Mount Saint Helens National Volcanic Area Designated

Mount Saint Helens, site of volcanic eruptions since March 1980, has been designated the first National Volcanic Area. R. Max Peterson, chief of the USDA's Forest Service, said he made the designation in recognition of the international and national scientific and public interest in this unique area and to provide additional protection for its important geologic features.

The designated area includes 84,710 acres within and adjacent to the Gifford Pinchot National Forest in Washington State.

A land management plan for Mount Saint Helens was issued by the Forest Service on October 15, 1981.

"This designation, the only one of its kind, highlights the uniqueness of this significant area," Peterson said. "It also will give additional emphasis to our efforts to protect the area for research, public education, interpretation, and recreation." It joins the Madison River Earthquake Area in Montana, Mendenhall Glacier in Alaska, Blanchard Springs Caverns in Arkansas, and other designated natural wonders in the 190-million acre National Forest System.

Office of Rural Development Policy Created in USDA

Secretary of Agriculture John R. Block has established the Office of Rural Development Policy, which is designed to seek a "practical strategy for responding to the

diverse problems and opportunities in rural America."

The new office staff previously was part of U.S. Department of Agriculture's Farmers Home Administration (FmHA), but will now report directly to Frank W. Naylor, Jr., under secretary for small community and rural development. It will be headed by John C. McCarthy, who has been serving as deputy administrator for policy management and coordination at FmHA.

Block said that by elevating the rural development policy function to the under secretary's office, he hopes to insure better integration of agricultural concerns and rural development.

"I feel that this action will help strengthen our performance in both of these areas," he said. "You can't separate agriculture from rural development. Nearly 700 counties continue to have agriculture as a principal source of personal income. At the same time, we have to understand that the actual business of farming does not dominate every rural community in this country."

Rural development was assigned as a major USDA mission in the Agricultural Act of 1970. The Rural Development Act of 1972 reinforced this mandate, and the Rural Development Policy Act of 1980 restated the mandate and the Secretary's role of providing leadership and coordination for national rural development efforts.

To carry out the provision of the Rural Development Policy Act of 1980, Block said he has directed the new office to develop a national strategy for:

- Identifying emerging rural issues and needs on an ongoing basis;
- Strengthening the State and local

government role in rural development;

- Developing and implementing policy guidelines that can provide sound government program direction for service to rural America; and
- Encouraging the private sector to expand their role in rural development.

"It will be a great challenge to insure revitalization in ways that preserve the heritage of rural America," Block said. "I believe that the creativity, genius, and private resources are there, waiting to be applied."

Water Supply, Wastewater Management Films Available

The Alternative Is Conservation is a film about the critical water shortage facing America. It is designed to increase public awareness, which is needed to promote water conservation in the community.

The film presents an in-depth view of eight communities, the water problems they have faced, and the variety of ideas they had for successfully solving them.

It includes interviews with water commissioners, local government officials, homeowners, Board of Health members, and others. The film was awarded first prize for films by the National Environmental Communicators in 1980.

Affluent Effluent: New Choices in Wastewater Treatment is a film about making good investment decisions for wastewater treatment.

The film looks at 17 communities across the country and examines a variety of practical and creative approaches to wastewater

treatment which can save them money and time in meeting water standards. It demonstrates what a community can do with local ingenuity, good engineering, and a determination to solve their problems better at lower costs to the taxpayer. A 28-page handbook accompanying the film includes case studies and contacts.

Hundreds of communities, consulting firms, and State, local, and regional agencies have already used the films in conjunction with discussion or educational programs. The films provide a forum for constructive, informed discussion among viewers.

For more information about rental or purchase of the films, contact Laura Brecht at Water Films, 30 Bates Road, Watertown, Mass. 02172, or call (617) 926-0326.

Drugs and Alcohol: A Bad Mix

The Food and Drug Administration reports the combined effect of alcohol and drugs accounts for around 2,500 deaths and 47,000 emergency room admissions each year.

The report mentions that of the 100 most frequently prescribed drugs, more than half contain at least one ingredient known to interact adversely with alcohol. These include sleeping pills, tranquilizers, and everyday aspirin. It should be remembered that tranquilizers increase the depressant effects of alcohol and vice versa. Minor tranquilizers intensify the effects of drugs such as alcohol, barbiturates, and opiates.

Alcohol can also increase the action of barbiturates in depressing

the central nervous system. It takes less than half the amount of barbiturates to cause death when combined with alcohol as it does when the drug is taken alone.

Both kinds of drugs can have the same synergistic effect with alcohol even hours after the drugs are taken. For all these reasons, alcohol should be avoided when you are taking prescription drugs, especially if you are planning to drive. The intelligent thing to do is to avoid alcohol when taking any drug, no matter how harmless it might seem to you.

James Engleka,
safety and health manager, SCS, Washington, D.C.

The Scott River Is No Longer a Washout

The loss of the deep, fertile soil of the Scott Valley in northern California began in the mid-1800's when gold was discovered. Gold brought miners. But when gold played out around 1900, miners who remained turned to agriculture.

Before the miners, dense brush and trees covered the lower valley and the Scott River looped through in wide turns. The miners-turned-farmers cleared the valley, drained its lower end, and straightened the river's meandering course.

Although their efforts brought the valley's best soil into production, they also resulted in a swifter, more erosive river.

During the next 40 years, in flood after flood, the river widened its channel. Cleared farmland offered little resistance. In spots, the river became 10 times its original size. More than 1,500 acres of the valley's best agricultural land were lost to the river's ceaseless bank cutting.

Farmers tried many methods to stop the land loss—none was successful. In 1949, they joined forces to form the Siskiyou Resource Conservation District (RCD). The RCD worked with Soil Conservation Service technicians to solve the erosion problem. The technicians recommended large rock riprap and revegetation to stop the bank cutting.

One farmer agreed to try the suggested treatment. Large rocks were placed along a 1,000-foot section of riverbank on his property. The section had previously been treated with other methods three times; each time they had washed out.

The entire valley watched. The treatment was a success. SCS technicians soon had more calls for help than they could answer. Each year since then, more rock has been placed on the banks of the Scott River. SCS Soil Conservation Technician Alvin Lewis spent 23 years assisting with the erosion control. According to him, 50 miles of riverbank have been protected.

Much of the work was cost shared under the Agricultural Conservation Program, designed to help farmers install conservation practices that benefit the public. There are many benefits from the Scott River project: farmers farm land along the river without fear of losing it, willows grow in the rock and are pleasing to look at, the water is cleaner, and fish and other wildlife have improved habitat.

"I've seen so much good done in the valley," said Lewis. "The trees are back; the water is cleaner. I'm proud to have been a part of the work that made it all possible."

Robin Frazier,
public information specialist, SCS, Redding, Calif.

Diver Helps Unplug Drainage Pipe

When it became obvious that something was plugging the underwater drainage pipe at the West Fork Pond River watershed dam in Hopkinsville, Ky., officials of the watershed conservancy district asked the Soil Conservation Service for help. SCS Civil Engineering Technician Richard Matlock says, "There were two choices, either cut a part of the embankment down to determine what was causing the blockage, or send a diver down to check the pipe."

The West Fork Pond River Watershed Conservancy District, the sponsor of the watershed project and responsible for its maintenance, decided to hire a diver. Colonel Edward J. Tye, chief of the Kuhn Dental Clinic at the U.S. Army's Fort Campbell, agreed to help. Making four dives in 2 hours, Tye discovered a beaver dam about 8 feet long and 4 feet high, part of which was blocking the 36-inch-wide spillway conduit pipe.

"My first inclination was just to clear out the debris from the pipe," says Tye, "but the SCS people had warned me not to because the suction from the water going through the cleared pipe would probably suck me through the pipe too."

SCS provided technical assistance in clearing the drainage pipe and removing the beaver dam, which was done with specially designed augers. The blockage had presented no danger of an overflow or damage to the dam because the flood storage pool and emergency spillway were still available for use.

Tye has 10 years of experience in scuba diving and he says that this was not the first time he had helped

a community. "I've assisted in all kinds of underwater searches and investigations," he says, "mainly because I truly enjoy diving."

Adapted from an article by Steve Lawrence in the April 23, 1981, edition of the *Fort Campbell Courier*, Fort Campbell, Ky.

Grazing System Boosts Weaning Weights

A 24-percent increase from 485 to 600 pounds average weaning weight on their cattle in 1 year—that was the remarkable accomplishment of Warren and Henry Brensing of Mullinville, Kans.

They were just not satisfied with their Limousin-cross heifer calf weaning weights of 485 pounds per head at the end of 1979. They knew their sandhill rangeland was weedy and in poor condition.

To increase their weaning weight, they joined the Sunflower Resource Conservation and Development range-forage-livestock improvement program. That winter, with Soil Conservation Service technical help, they planned some significant changes in their 1980 forage program.

Instead of grazing their rangeland all summer, they doubled their stocking rate from April 1 to July 15. They sprayed the range for weed control in May.

At the same time, they tore up an irrigated circle of alfalfa and planted it to hybrid pearl millet. It was ready to graze by mid-July. All cows and calves were then transferred to the millet pasture to stay until about November 1. The rangeland was not grazed the last half of the growing season.

In early September, they seeded wheat into the growing millet while cattle were still on it. The irrigated wheat furnished a gradual transition from millet pasture in late summer to wheat pasture in early fall. This cropping system protects the land from wind erosion during the critical winter and spring months. Adequate residues are returned to the soil to maintain tilth and fertility.

By weaning time about November 1, many calves looked almost as big as their mothers. The combination of highly palatable millet and wheat furnished high gaining pasture for the calves, plus high milk-producing pasture for the cows.

When calves were weaned and moved to separate wheat pasture, their growth did not slow down. They showed no weaning stress when separated from their mothers. The calves weighed in at about 600 pounds compared to 485 pounds a year earlier from the same cows and bulls.

The rested rangeland developed a good stand of sandlovecgrass and bluestem grasses, even during an extraordinarily hot, dry summer. Increased vigor in the root systems produced even better pasture in the spring of 1981.

As this type of forage system is fine tuned in the next few years, the Brensings can look forward to even better weaning weights. As the rangeland improves in condition, the Brensings will be able to increase salable beef production with little increase in costs. At the same time, the rangeland resource base is protected.

Glen P. Snell,
range conservationist, SCS, Medicine Lodge, Kans.

Animal Waste Control System Heats and Cools Hog Barn

Charles Fernholz, a Lac qui Parle County, Minn., hog farmer, is making his new animal waste control facility do double duty. While protecting the environment, his system is also cooling his hog barn in summer and heating it in winter.

Last summer, Fernholz requested assistance from the Lac qui Parle Soil and Water Conservation District (SWCD) to design a system that would keep animal wastes from running onto a neighbor's field and into a county ditch. Soil Conservation Service and SWCD personnel began working with Fernholz to come up with a design that would correct the problem.

From the surface, the solution looked easy: an earthen holding pit to store the wastes and a diversion to keep runoff from the buildings away from the pit. Then soil borings were taken by SCS employees to identify any potential problems. One problem was found: a seasonal high water table which, if allowed to come in contact with animal wastes, would result in ground water contamination. The water table had to be lowered or the storage pit could not be installed.

A tile system was designed to lower the water table. Outletting into a county ditch system, 10-inch tile was placed around the perimeter of the storage pit 2 feet below the bottom of the pit. Pearock was placed around the tile to provide a stable bed and insure proper drainage. With the tile placed 16 or more feet deep, the ground temperature would remain constant and Fernholz saw an opportunity to get extra use out of the tile system. He attached

risers from the surface to the underground tile and connected a tile line to the hog barn. He draws air through the riser into the tile line. The ground temperature warms the air, which is used to heat the barn in winter. The system could also be used during the summer to cool the barn. The tile and risers were installed last November, and Fernholz used the natural heating system through the winter in his main hog barn.

"The only problem I experienced through the winter was some excess humidity," Fernholz said. "The warmer air picked up moisture from the ground and was pulled into the barn by the fan. Other than that it worked just fine. The air temperature is 52° F when it comes into the barn, summer or winter."

The earthen holding pit, constructed and lined with clay, measures 180 by 120 feet at the top and is 12 feet deep. The pit will store wastes for 2,000 feeder pigs and 200 sows for a period of about 9 months. Water will initially be pumped into the pit and a flushing system will be used to move wastes from the main hog barn into the pit. When it's time to empty the pit, the hog waste will be knived into cropland.

USDA's Agricultural Stabilization and Conservation Service cost sharing is available for eligible landowners for 75 percent or \$3,500 of the practice cost, whichever is less. Due to the complexity of the Fernholz waste storage facility, the \$3,500 ACP cost-share payment covered less than 50 percent of the eligible cost-share expenses. ASCS determined eligibility for the animal waste control facility by using a computer model. Information such as the number and type of livestock, size and location of feedlots near a

water source or a discharge point, and the drainage area above and below the animal lot was fed into the computer. Based on this information, the computer assigned a rating to the livestock operation indicating its potential for water pollution. The waste control system was designed using this rating and SCS soil survey information.

Glen A. Kajewski,
district conservationist, SCS, Madison, Minn.

New Tillage Publication Available

The University of Kentucky is publishing *Tillage Systems and Social Science* to identify research issues associated with the social dimensions of tillage systems. It is designed to help social scientists share ideas and research results but will also be of interest to policymakers and to those working in the technical areas of tillage research.

This new publication, which is to be issued "occasionally," is a vehicle for presenting tillage issues ranging from the general problems of science and society to more specific ones of appropriate technologies.

For more information write to the editor, *Tillage Systems and Social Science*, S-205 Agricultural Science Center, North, University of Kentucky, Lexington, Ky. 40546.

New Publications

Land in America: Its Value, Use, and Control

by Peter Wolf

This book relates land to the daily concerns of Americans and explains the trends and issues that determine the value of land throughout America, now and in the future.

The author discusses myths and realities, examines present attitudes, and targets future trends about land. Part one is an overview of land, power, and wealth and part two is about changing land values in a changing country.

With more than 125 photographs, maps, and diagrams, this book offers background, insight, and a wealth of information that provide the basis for making sound decisions. This is a book for anyone who owns, buys, sells, regulates, plans, uses, or cherishes land.

This book is available for \$20 from Pantheon Books, 201 East 50th Street, New York, N.Y. 10022.

Farmland or Wasteland: A Time to Choose

by R. Neil Sampson

This book is a gathering of facts about our disappearing farmland and suggests ways we can protect our food-growing resources for the future.

The 15 chapters in this book include such topics as the pressure on farmers to exploit the land, the problems associated with farmland conversion, the effect of soil erosion on national productivity, agriculture competing for water, public programs, and new approaches to action.

This book is especially valuable to anyone who cares about the way farmland is eroding, being bulldozed for development, or being exploited for short-term profits; and to anyone who is interested in the future of our food system.

The author proposes a plan to rebuild our fertile land, with practical suggestions for the farmer, communities, and the public on what to do to protect our farmland for the future.

Photos, charts, and tables are used effectively throughout the text.

The book is available for \$16.95 (\$18.95 in Canada) from Rodale Books, 33 E. Minor Street, Emmaus, Pa. 18049.

Reclamation and Revegetation of Land Areas Disturbed by Man

by R. F. Follett

This annotative bibliography of publications, issued by the U.S. Department of Agriculture's Agricultural Research Service (ARS), explains the technical objectives of National Research Program (NRP) 20770 for the period 1972-80. This program links research by ARS to other agencies within USDA. The technological objectives of NRP 20770 are: (1) integrating plans for reclamation and use of land before mining; (2) restoring disturbed areas to optimum level of agricultural productivity or other uses; (3) stabilizing disturbed areas against erosion, subsidence, and slides; (4) preventing degradation of surface and ground water in and adjacent to disturbed land areas; (5) using waste materials in reclaiming disturbed areas; and (6) improving scenic, wildlife, and esthetic values of disturbed areas.

In the front of this bibliography is an author index and a list of addresses of ARS locations involved in strip-mine reclamation. The last four pages list the common and scientific names of plants experimentally tested for their potential importance in strip mine reclamation.

A limited number of single copies are available from the USDA Agricultural Research Service, Publications Request and Distribution, Washington, D.C. 20250.

Western Energy and Land Use Team Publications: A Bibliography With Abstracts

by the Fish and Wildlife Service, U.S. Department of the Interior

The Fish and Wildlife Service created the Biological Services Program (BSP), which comprises the Office of Biological Services (OBS), four national teams (one of which is the Western Energy and Land Use Team), and regional teams.

The Western Energy and Land Use Team (WELUT) is the Service's major technical research and development organization for the study of western land and water use.

This bibliography contains an annotated list of BSP publications produced or sponsored by the WELUT. It also contains information on publication availability, along with several indexes that provide a means of locating specific publications of interest.

Each entry contains ordering information and a brief abstract describing the publication.

A limited supply of single copies of this bibliography are available by writing Information Transfer Services, Western Energy and Land Use Team, Fish and Wildlife Service, U.S. Department of the Interior, 2625 Redwing Road, Fort Collins, Colo. 80526.

Crop Residue Management in Livestock Production and Conservation Systems

This review has been compiled as part of an agreement between the Agricultural Research Service in El Reno, Okla., and the Oklahoma Agricultural Experiment Station in Stillwater.

The review is published in three parts because many readers will primarily be interested in only one part of the review and because of the total length of the review.

Part I (P-795) "The Use of Crop Residues as Feedstuffs for Ruminant Animals" evaluates

the nutritional adequacy of crop residues as feedstuffs for ruminant animals. Part II (P-796) "Agronomic Considerations of Crop Residue Removal" attempts to provide sufficient data to make intelligent decisions regarding the effect of crop residue removal. It also discusses the concerns regarding crop residues and their effect on organic matter, soil structure, phytotoxicity, and pest problems. Part III (P-797) "Methods of Harvesting, Transporting, Storing, and Feeding Crop Residues" is helpful in choosing the optimum system. The data available in this report can be used only as first estimations in analyzing and comparing the different systems.

Each part has a different author or authors and contains many tables, charts, and line drawings, and each part has a list of literature cited at the back.

A limited number of single copies are available from Gerald W. Horn, Animal Science Department, Oklahoma State University, Stillwater, Okla. 74078.

Flood Plain Management: Why We Need It

by the Soil Conservation Service

This full-color pamphlet explains what flood plains are, their importance, and why flood plain management is so greatly needed.

The pamphlet explains how SCS specialists, working with local governments and conservation districts, can help communities plan flood plain management. It also shows some examples of simple but practical floodproofing methods.

Copies are available from local and State Soil Conservation Service offices.

1981 Conservation Education Award Winners

by Charlotte Nichols

The 1981 winners of the National Association of Conservation Districts-Allis-Chalmers Environmental Conservation awards have been chosen. The Teacher of the Year is Donald C. Vestal, an agriculture teacher for Surry Central High School in Dobson, N.C. Runner-up is Tim S. O'Halloran, a science teacher at Booker T. Washington High School in Tulsa, Okla. The Conservation District of the Year is the Marion County Soil and Water Conservation District (SWCD), Indianapolis, Ind., and the runner-up is the Mobile County SWCD, Mobile, Ala.

Winning Teachers

Donald Vestal, southeastern region winner sponsored by the Surry SWCD, has taught agriculture to grades 9 through 12 at Surry Central High for the past 11 years.

Vestal was instrumental in developing the Pick Shin Nature Center and Farm Living Museum on a 55-acre area of the school campus. The facilities include two nature trails, a farmstead, country store, pond, swamp, organic garden, orchard, theater, campgrounds, and picnic areas.

Vestal uses a "helping hands" approach at the center. For the first month of school, he teaches and trains his high school students to serve as guides for the center. They, in turn, work in pairs with several elementary students. A theme is created for each grade level kindergarten through 8, areas of study within the theme are identified, and a curriculum developed. The middle grade students concentrate on single themes such as water, conservation, heritage, ecosystems, and soils. On days when the center has no visitors, students develop teaching materials, build study

areas, and act as caretakers.

To encourage the students to continue learning after they leave the center, followup curriculum materials were developed and are used by teachers in their classrooms. The program reaches 8,500 students in the Surry County schools, and it has been made available to five other school systems in the area. The center is available for use by secondary and junior college teachers for labs, drama, and art classes. Senior citizens, church, and civic groups also enjoy the facilities for weekend programs.

A visit to Pick Shin Nature Center shows that Donald Vestal practices what he preaches. Logs across trails to divert water and prevent erosion, water runoff demonstration areas, an organic garden, and wildlife feeding areas, as well as a watershed project, are a few of his workable ideas. Under his guidance, the students also dismantled and reassembled a 103-year-old log house for use as the center's headquarters. Each year, additional relics throughout the county are preserved in the Farm Living Museum.

Tim S. O'Halloran, national runner-up and South Central regional winner sponsored by the Tulsa County Conservation District, also believes in a student-teaching-student approach to conservation education. As a science teacher for grades 9 through 12, he is responsible for ecology, biology, and zoology classes at Booker T. Washington High School. His program consists of five major areas of concentration: classroom, outdoor classroom, elementary environmental education, field trips, and an ecology club. (See article in the October 1981 issue of *Soil and Water Conservation News*.)

O'Halloran's goal is to have a place in every school where children can become acquainted with nature, ecology, and conservation of resources so they can be responsible citizens. His advanced ecology high school students are responsible for carrying out the elementary environmental education programs. In the outdoor classrooms, students study aquatic life in a pond; various kinds of trees, flowers, plants, rocks, and stumps; and a variety of small snakes and lizards which students have released in the area. They also study wildlife and plant habitats to determine which species will have the best chance of survival. During weekends in the spring, students have the opportunity to go on field trips in other parts of the State or to a nearby State to study unique environmental areas.

O'Halloran's Ecology Club emphasizes involvement in education, school service, and development of outdoor classrooms. Members of the club undertake projects to make the school environment more pleasant including planting trees and shrubs, repairing eroded areas on the campus, and conducting an anti-litter campaign.

Regional Conservation Teacher of the Year winners are: Northeastern region, John S. Hilkevich, Chatsworth, N.J.; North Central region, Virginia Susan Cook, West Salem, Ohio; Northern Plains region, Donald J. Josko, Plankinton, S. Dak.; Southwestern region, Joe S. McKinnon, Roswell, N. Mex.; and Pacific region, Dwight Morgan, Colville, Wash.

Winning Districts

A wide variety of conservation education efforts keeps the Marion County SWCD in Indianapolis, Ind.,

involved throughout the community. The SWCD employs an education specialist to carry out various activities such as workshops, conservation education training sessions for teachers in Indianapolis public schools, and special conservation tours. Last year, 36 teachers in the metropolitan area received training on soil descriptions, watershed boundaries, forestry and wildlife management, erosion control, ecology and stewardship, and application of conservation practices.

Indiana University and Purdue University received assistance from the Marion SWCD in designing two new courses, "Soil Survey Interpretation and Use" and "Land Use in Marion County," which are now offered to students for college credit. The SWCD's education specialist also served as a lecturer for 12 university classes and taught a 3-hour graduate course, "Environmental Conservation," which was taken by university students and teachers from area schools.

The Marion County SWCD works with a local high school ecology club, helping to train the students to teach elementary school students who visit the Hollingsworth outdoor educational farm in Indianapolis. Other activities included starting nine new outdoor classrooms, developing self-interpretive trails, tree planting, and erosion control at Girl Scout camps. The SWCD also sponsors six young people to 4-H Conservation Camp each year. They support adult conservation education programs through slide talk presentations to civic and professional groups, workshops on soil survey use, and field tours for farmers and city officials. A unique, 10-day, self-interpretative auto tour of good and bad practices in a mod-

ern subdivision was designed by the SWCD for public conservation education.

The year's most important educational activity was establishing a solid relationship with the newspapers and news media in the Indianapolis area. By opening the doors of communication and education, SWCD officials feel they are succeeding in creating a public awareness of environmental problems and their solutions.

The national runner-up for Conservation District of the Year is the Mobile County SWCD in Mobile, Ala. A Mobile County Youth Conservation Program, sponsored by the SWCD, came about as a result of the devastation caused by Hurricane Frederic and the idea that the youth of the county could make a tremendous contribution toward solving conservation problems. A Youth Conservation Advisory Committee was organized with members from civic and community organizations. The SWCD board worked closely with the committee to get the program out of the talking stage and into action.

They solicited input from the public, municipalities, civic organizations, and youth groups for ideas of projects that would meet the program objectives, which were to conserve soil and water resources, manage or promote wildlife resources, beautify a particular eyesore, and have a long-lasting benefit to the community when the project was completed. Projects are approved and assigned a sponsor and adult supervisor, usually a member of the Youth Conservation Committee. The projects receive a number and copies are filed in the Boy Scout, Girl Scout, and SWCD offices to enable troops to have

ready access to approved projects. A specially designed conservation patch is awarded to each individual participating in the completion of a project.

Some of the completed projects include new trail construction in a park, planting pine trees on 7 acres of a county landfill, a number of erosion control and tree planting projects on school campuses, building 800 bluebird boxes, and the beautification of a busy downtown intersection.

The SWCD provides assistance to the outdoor classrooms and learning centers in the county and sponsors a 4-H Conservation Essay, a Conservation Poster, and Land Judging Contests. Environmental conservation training sessions for teachers are held and SWCD personnel appear on television programs and participate in radio spots to educate these audiences in conservation.

Regional Conservation District of the Year winners are: Northeastern region, New Castle CD, Newark, Del.; South Central region, Oklahoma County CD, Oklahoma City, Okla.; Northern Plains region, Morton County SCD, Mandan, N. Dak.; Southwestern region, Yuma SCD, Yuma, Colo.; and Pacific region, Klamath SWCD, Klamath Falls, Oreg.

Charlotte Nichols,
director of communications,
National Association of Conservation
Districts, Washington, D.C.

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Meetings

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| January | 3-8 | American Association for the Advancement of Science, Washington, D.C. |
| | 10-14 | American Farm Bureau Federation, San Diego, Calif. |
| | 22-28 | North American Gamebird Association, Honolulu, Hawaii |
| February | 7-11 | National Association of Conservation Districts, Phoenix, Ariz. |
| | 8-12 | Society for Range Management, Calgary, Alberta, Canada |
| | 15-18 | Land Improvement Contractors of America, Orlando, Fla. |
| | 26-March 1 | American Association of School Administrators, New Orleans, La. |
| | 28-March 4 | American Institute of Chemical Engineers, Orlando, Fla. |
| March | 7-9 | American Pulpwood Association, New Orleans, La. |
| | 14-20 | American Society of Photogrammetry and American Congress on Surveying and Mapping, Denver, Colo. |
| | 19-21 | National Wildlife Federation, Milwaukee, Wis. |
| | 26-31 | 47th North American Wildlife and Natural Resources Conference, Portland, Oreg. |

New Publications

Conservation Tillage and Conventional Tillage: A Comparative Assessment

by Pierre Crosson

This 35-page booklet presents a look at research on the economic and environmental effects of conservation and conventional tillage practices. The author compares conservation and conventional tillage technologies on the basis of how much labor, equipment, fuel, fertilizers, pesticides, and management each requires and what effect each has on crop yields and the condition of soil and water resources.

This booklet contains 12 tables, the author's conclusion, and a list of references cited at the back.

It is available from the Soil Conservation Society of America, 7515 Northeast Ankeny Road, Ankeny, Iowa 50021. Single copies are \$5 for nonmembers and \$4 for SCSA members.

The Fruited Plain: The Story of American Agriculture

by Walter Ebeling

In this book, the author deals with the seven geographic regions of the United States—from the East to California—giving the history and present status of agriculture for each region. He is concerned with the environmental, ecological, and sociological aspects of agriculture and its supporting industries.

Scattered throughout the book are photographs, tables, and diagrams. At the back of the book is a list of literature cited and an index.

This book is available for \$22.50 from University of California Press, 2223 Fulton Street, Berkeley, Calif. 94720.

Recent Soil Surveys Published

by the Soil Conservation Service

California: Kern County.
Colorado: Kiowa County and Piedra Area.
Georgia: Crisp and Turner Counties.
Idaho: Cassia County.
Indiana: Steuben County.
Iowa: Marshall County.
Kentucky: Warren County.
Louisiana: Franklin Parish.
New York: Oswego County.
North Dakota: Grand Forks County.
Pennsylvania: Allegheny County, Blair County, and Lebanon County.
Texas: Nolan County, Palo Pinto County, and Roberts County.